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Howard on the British warblers, have shown that these spreading movements are typically reflex, and that they are common to many periods of excitement, so it is probable that they really have nothing to do with "charming" the female, in the sense in which this word is commonly understood. Even the dull cat-bird can be seen to spread before a prospective mate, and as Howard has shown, the presence of the female is not always necessary to excite such behavior during the mating period. Essentially the same movements are executed at the instance of sudden sounds, or of fear, not to speak of the spontaneous antics of the turkey gobbler, or even of the gaudy peacock, which, as Darwin acknowledged, will spread in the presence of poultry and swine.

In a chapter on Reptiles and their Progeny, the author refers to the ancient story of the viper "swallowing" her young in times of danger, with the remark that since this reptile is viviparous, many persons who had supposed that they had taken its young from the alimentary tract had really assisted at their birth. Whether there is any germ of truth at the root of this hoary belief, or whether it rightfully belongs among the vulgar errors to which Thomas Browne consigned it in the seventeenth century, we do not pretend to say, but the author's suggestion does not remove all the difficulties. Many American naturalists of repute have supported the contention that certain snakes do occasionally refuge their young in the throat or esophagus, and numerous American species, both venomous and non-venomous, are included in the list. It is a matter of some historical interest that the American Association for the Advancement of Science, which met at Portland, Maine, in 1873, held in one of its sections a sort of convention on snakes. G. Browne Goode, who afterwards became the head of the United States National Museum, led the discussion, and F. W. Putnam, secretary of the Association, Theodore Gill, and other prominent naturalists took part in it. Goode's paper, which was suggested by a still earlier one by Putnam, in the *American Naturalist* for 1869, and was published in full in the Annual Re-

ports of the society, was an attempt to show that many snakes give temporary refuge to their young, much as certain fishes are known to carry about and protect their eggs in their mouths. He received the support of all these men, in addition to that of one hundred other witnesses whom he considered reliable, including Sidney J. Smith, noted for his accuracy as a marine zoologist, and Edward Palmer, of the Smithsonian Institution. So strongly was this "viperine" story supported that Dr. Gill, in summing up the evidence, declared it was "sufficient to set the matter for ever at rest." This will illustrate in still another direction the difficulties of interpretation in animal behavior, whether actual or visionary. If such competent witnesses and judges were deceived, it must be due to some other cause than that which the author of "The Infancy of Animals" has adduced. It may be that the young of many snakes—and this is an idea which we owe to a somewhat old but excellent work by Miss Hopley—respond instinctively to the calls of their parent by running towards her head and afterwards concealing themselves under her body. If young snakes were thought to be seen running into the mouth, it would require but little imagination to see them pop out again, the mind having already, perhaps, pictured such a scene in advance. Otherwise, so far as we can see, if we discredit all these accounts, we must continue to regard the snake as the fruitful cause of all moral obliquity.

The author's illustrations, particularly the photographs, are excellent, and add distinctively to the attraction of a valuable and interesting work.

FRANCIS H. HERRICK

LAUSANNE,
June 20, 1913

Explosives. A Synoptic and Critical Treatment of the Subject as gathered from Various Sources. By Dr. H. BRUNSWIG. Translated and annotated by CHARLES E. MUNROE, Ph.D., LL.D., and ALTON L. KIBLER, M.S., Ph.D.

The excuse for producing a new book in the

field of explosives is well given in the preface: to bring together more closely the science and practise of the subject; to establish a closer cooperation between the scientist and the technologist. In this the author has succeeded most remarkably well. The important modern explosives are carefully reviewed and arranged according to chemical and physical views now held. Theoretical and mathematical discussions have been omitted, which makes the book valuable to the technologist who as a rule has troubles enough without trying to keep in practise on advanced mathematics.

In chapter one there is given a clear outline of the elementary principles relating to the general behavior of explosives. Chapters two, three and four treat of velocity, temperature and pressure produced by explosives on combustion. An excellent discussion of the products of explosive reactions as influenced by temperature and pressure is given in chapter five. Chapter six treats of intensity and velocity of the explosive impulse. Chapter seven is of special importance to miners and ordnance officers since it treats of the flame of an explosion. Igniters, fuses, detonators and fulminates are described in chapter eight. In chapter nine there is a brief but excellent discussion of black and smokeless powders. Blasting explosives in chapter ten are fully discussed, including hints for handling, use and destruction of explosives generally.

A valuable feature of the book is the splendid list of references to literature on explosives and related subjects. The work, which on the whole is excellent, has lost nothing by translation. Works of this character are frequently ruined by translators, either on account of lack of knowledge of the foreign language or unfamiliarity of the subject. In this case the translators show a thorough knowledge of German, and surely Dr. Munroe is more familiar with explosives than any one else in this country. It is gratifying to note that attention is called to the fact that the term "nitroglycerine" is not in accordance with present-day chemical nomenclature. Why not discard also the name "nitrocellulose"? The

latter is a nitrate just as much as the former. On page 161 in equation one there should be shown six carbon dioxids instead of two, and on page 162 where the decomposition of picric acid is shown six molecules, not two, of hydrogen are formed. Nothing further remains to be said except that no explosives library is up to date without this work.

A. P. SY

NOTES ON METEOROLOGY AND CLIMATOLOGY

THE SOLAR CONSTANT OF RADIATION

VOLUME III. of the Annals of the Astrophysical Observatory of the Smithsonian Institution has just appeared (a great quarto volume of 241 pages). As a result of recent investigations of the intensity of solar radiation, these noteworthy results have been obtained: (1) That the mean value of the solar constant of radiation for the epoch 1905-1912 is 1.929 calories per square centimeter per minute; (2) an increase in the solar constant by 0.07 calories per square centimeter per minute is accompanied by an increase of 100 in sun-spot numbers; (3) numerous, almost simultaneous measurements of the solar constant at Mount Wilson, California, and at Bassour, Algeria, would indicate that the intensity of solar radiation experiences an irregular change which frequently exceeds 0.07 calories per square centimeter per minute and which follows a ten-day period; (4) indications of two entirely independent phenomena makes it reasonable to believe that the variations in the solar constant are caused by the sun itself and probably not by meteoric dust or other phenomena between the sun and earth.¹

WEST INDIA HURRICANES

IN a recent Weather Bureau bulletin entitled "Hurricanes of the West Indies," Professor Oliver L. Fassig gives the results of a thorough

¹ C. G. Abbot, F. E. Fowle and L. B. Aldrich, "Die Solarkonstante und ihre Schwankungen," *Meteorologische Zeitschrift*, pp. 257-261, June, 1913.

² Bulletin X., U. S. Weather Bureau, March 29, 1913, quarto, 28 pp., 25 plates.